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SELF-REGULATING

IMPROVED

LOW-PRESSURE STEAM

Heating and Ventilating

APPARATUS,

WITH OPEN BOILERS.

ERECTED BY

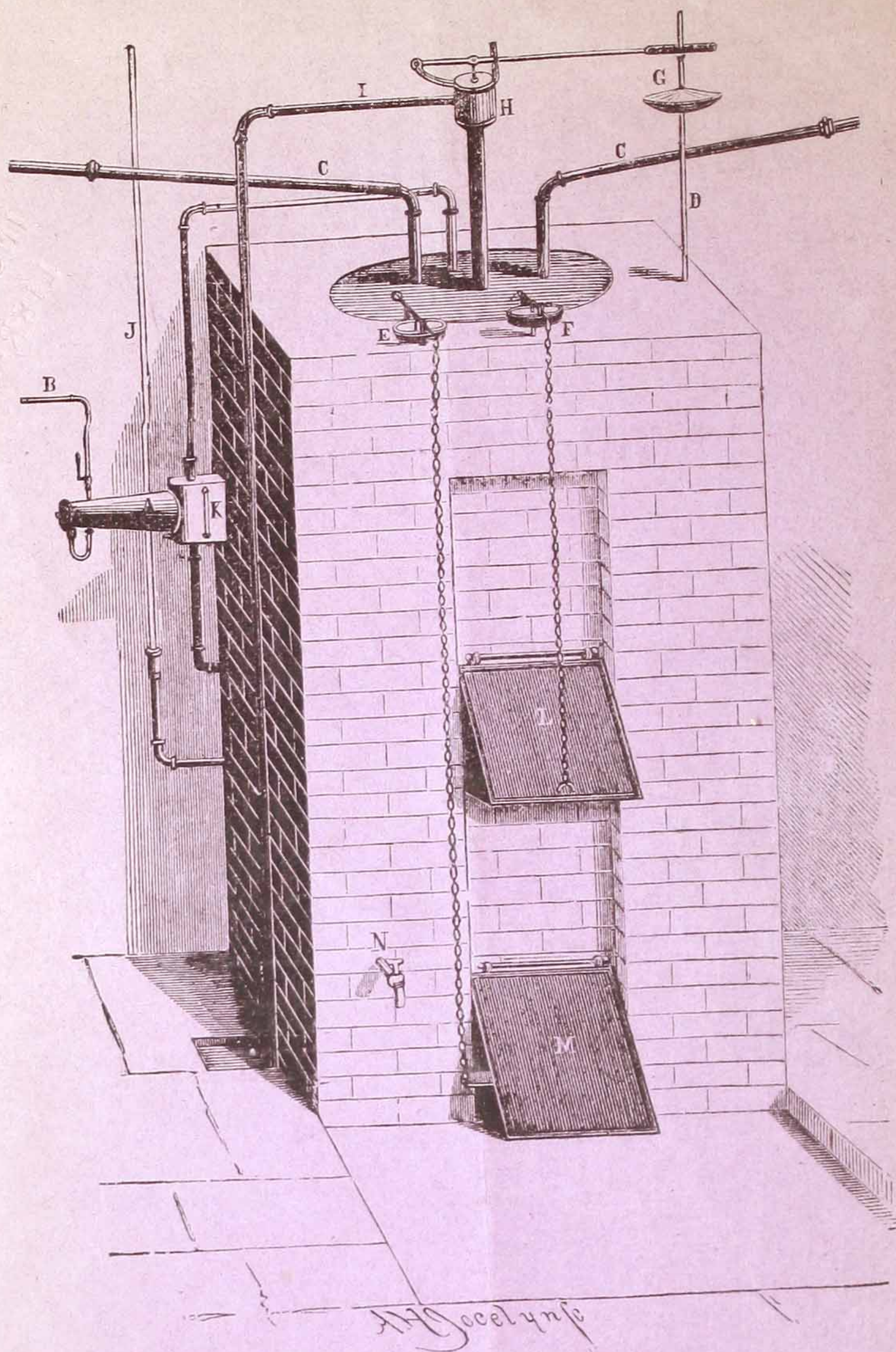
HENRY A. BARBER,

No. 524½ North Eighth Street,

PHILADELPHIA.

E. KETTERLINUS, Printer, Arch and Fourth Sts.

(c. 1880)



Boiler, Brick-work and Regulating Attachments.

The characteristic advantages of this Apparatus are Economy and Durability in construction, Economy of Fuel, Entire Safety from fire and explosion (which can be said with truth of no other Steam or Hot-air Furnace), Self-Regulation and Ease of Management, Freedom from dust, gas and noise, Even and quick distribution of heat, Simplicity and Durability, Adaptation to all places, Elegance of appointments where desired, Freedom from unpleasant draughts of air, *Efficient and Easy Ventilation*, nicety of adjustment to any required temperature; it occupies but little space, reduces cost of Insurance and Fuel. This radiant heat is peculiarly adapted to delicate lungs, and in other cases where hot air furnaces are open to great objections.

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HENRY A. BARBER,

No. 524½ North Eighth Street,

PHILADELPHIA.

FOR REGULATING

AND CONTROLLING

THE PRESSURE OF STEAM

IN BOILERS

AND IN OTHER

APPARATUS

OF THE

STEAM

BOILER

AND

OTHER

Introductory Remarks.

THE value of Steam, as an agent for warming buildings, is becoming so well understood, and the use of Steam Heating Apparatus has within the past few years become so common, that it seems now unnecessary to enter into any argument to prove its superiority over all other methods of Artificial Warming.

The *fire place* and *open grate*, though pleasant as an auxiliary, must be discarded wherever fuel is of any value, or apartments of much size are to be warmed.

The *Stove*, with its violent and uneven heat, its dirt, unsightliness and danger, will not be tolerated except where necessity compels.

The evils of the *Hot Air Furnace*, its injurious effect on health, the dryness of its heat, the dust and gases arising from it, and the impossibility of distributing the heat which it does generate, are so well understood, and the cause of such universal complaint, as to need no reiteration here.

The *Hot Water Furnace*, which was resorted to by some as a means of escape from the evils of the Hot Air Furnace, has difficulties of another sort. When properly constructed the quality of the heat is very good; but the slowness with which the large body of water it requires receives and imparts the heat, makes it impossible to obtain a sufficient quantity with sufficient rapidity to meet the requirements of a cold or variable climate, while it is subject to the same difficulty as regards the distribution of heat as the common furnace. Although occasionally revived in some form, it is, at best, only a warm weather heater, while in those forms where the heating surface is connected directly with the fire chamber, it has most of the objectionable features of the hot air furnace, and where circulating considerable distances in small pipes, the pressure required for its operation makes it highly dangerous.

The advantages derived from the use of Steam for transmitting and imparting heat have been long known; but the danger attending it, and the necessity for a skilful engineer to watch its operation, have very properly prevented its introduction into common use.

These dangers still adhere to the *High Pressure* System, and with the noise always attendant, and the cost of repairs necessary in an apparatus which undergoes so constant a strain in all its parts, must confine its use to factories, workshops and stores where power is required.

But with a *really Low Pressure Steam* apparatus all these dangers and difficulties are removed; all the advantages are retained. When Steam is generated under a pressure which by no possibility can exceed one or two pounds, when the consumption of fuel is regulated by the amount of steam used, and the supply of water by the amount the boiler requires, the apparatus may safely be left in the hands of an ordinary house servant or porter, while the heating surfaces supplied by Steam from such a source must give off a warmth not injurious to the atmosphere to be warmed, as in the case of a hot air furnace, and still not useless in severe weather, as in the case with the Hot Water Apparatus.

Too much care, however, cannot be employed by the purchaser in scrutinizing the apparatus offered to him, to see that it really has these positive safeguards against increase of pressure, and that it is not merely the old high pressure plan, under a new name, with all the dangers of the old system, aggravated by the fact that it is deprived of that watchfulness which every experienced engineer knows to be necessary in using High Pressure Steam—from being taken out of the charge of skillful mechanics, and put into the care of those ignorant of the first principles of Steam generation.

The apparatus described in these pages fully meets all the requirements which have been indicated as necessary.

It was first introduced more than fifteen years ago, and improvements and modifications have been added from time to time, until now it embraces everything really valuable that is known in Steam heating.

It has been steadily growing in favor, giving entire satisfaction wherever it has been used. We ask for it, and for the disinterested testimony of those who have used it, a careful examination, being fully assured that it will commend itself as the most DURABLE, EFFICIENT, HEALTHFUL, and in all respects desirable apparatus for warming that is now before the public.

THE NEW HAVEN

IMPROVED

HEATING AND VENTILATING APPARATUS.

THE attention of those interested in securing the most perfect system of artificial warming and ventilation, for both public and private buildings, is invited to the **LOW PRESSURE STEAM HEATING APPARATUS**, erected by the undersigned.

The necessarily brief description of the Apparatus which can be given here, will suggest some of the advantages of this method of warming, over others now in use, and a careful examination of the Apparatus itself, and of the testimony of those who have used it (which we bespeak from all who are intending to warm their dwellings or places of business), will show many more which we cannot here enumerate.

The Apparatus is based upon "Gold's" patents, with all the *real* improvements which long experience in the business have suggested.

The Boiler (for the sake of durability alone), is made of heavy wrought boiler iron, and is set in the cellar or basement, enclosed in substantial brick work, occupying much less space than an ordinary hot-air furnace.

Positive Safety from Explosion is obtained by the Hydrostatic or Open Column (the exclusive patent for which we hold).

This Column, connected with the Boiler at the bottom, stands at its side to such a height as to allow a pressure of two pounds of steam—and only that—to be generated; and as this Column is open at the top to the external air, *any further accumulation of pressure is simply impossible.*

The Automatic Draft Regulator, which is governed by the pressure of steam in the Boiler, gives perfect self-regulation of the draft to the fire, without any care on the part of the attendant, and the consumption of fuel is therefore only in proportion to the amount of heating surface actually in use.

The amount of water used is very small, and is automatically governed by a Water Regulator.

The steam which is thus economically and safely generated, is conveyed in iron pipes to the radiating surfaces which are located and adapted to the construction of the building to be warmed.

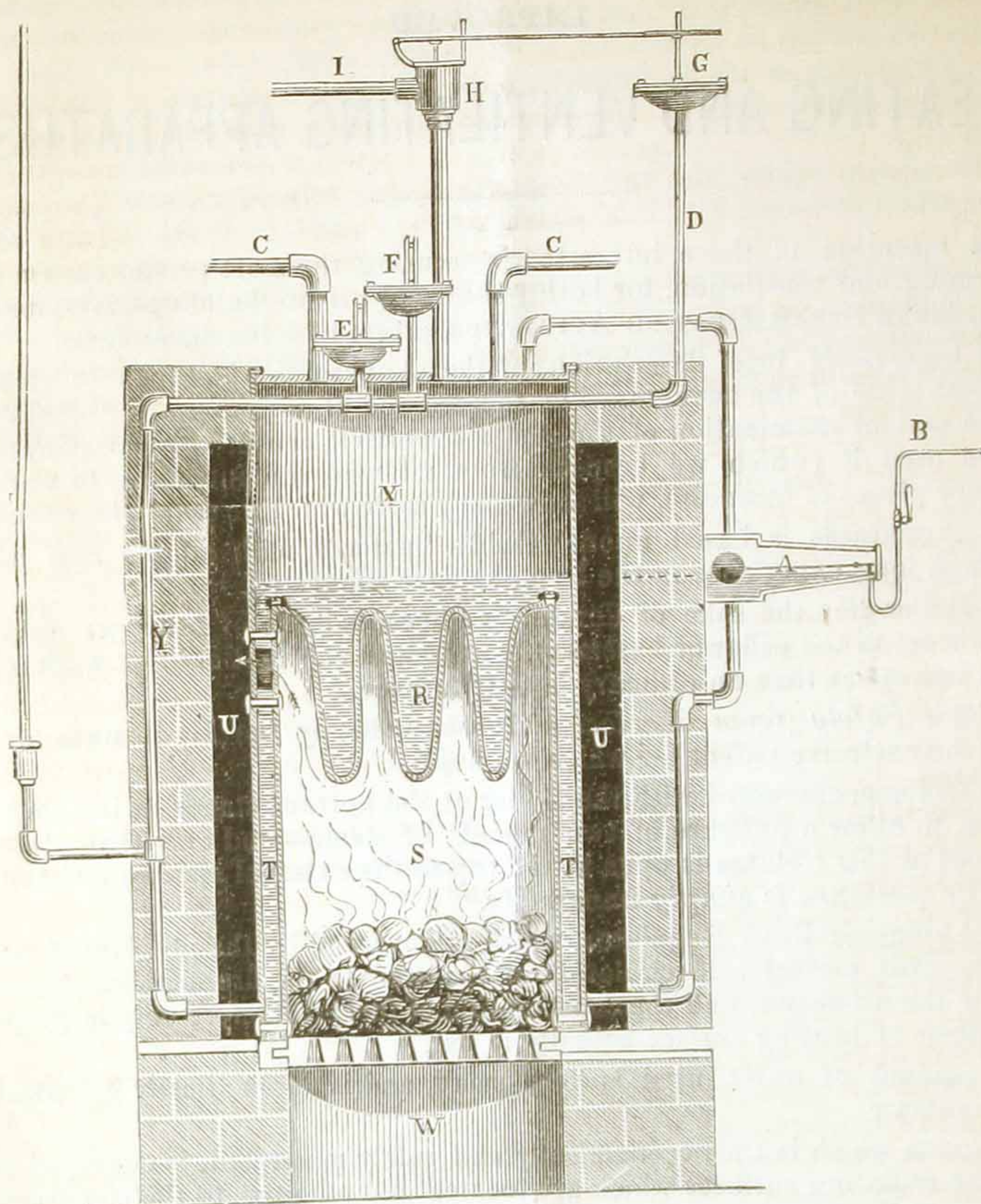
When Radiators are placed in the apartments, they are handsomely ornamented, or enclosed in screens with marble tops, or placed behind marble mantels, and in general appearance adapted to the furniture of the room.

When desired, the radiating surface—composed of coils of steam pipe—is placed in chambers in the cellar, and the warm air carried through tin flues and registers into the rooms. Often both methods may be combined to advantage in the same building. The heating surfaces, whether placed in the apartments to be warmed or in chambers in the cellar, are provided with self-acting air valves for the escape of the air from their interior.

Ventilating shafts, in which the ascending column of air is rarified by the introduction of heated steam pipes, are erected in schools, public buildings and other places where additional ventilation is desired.

Estimates, etc., furnished.

The Regulating Attachments.



A is the water feeder, B the service pipe connected with the water pipes from the street or from a tank in the house. This water feeder is composed of a cast iron chamber, enclosing a lever, having at one end a copper float, and at the other a valve governing the flow of water into the boiler. When the boiler requires water, the valve opens and allows it to flow in. When it has received the proper quantity, the float rises, shuts the valve, and stops the flow of water till more is required.

The water feeder is so connected with the boiler that it is not affected by the pressure of the steam, and operates equally whether there is or is not a steam pressure.

The amount of water required to fill the boiler is small, varying with the size, and as the water of condensation is all returned to the boiler, a very small quantity will make good the waste.

As there is never more than two pounds pressure of steam, the water pressure required to fill the boiler is but three pounds, or a head of only six and a half feet above the water line of the boiler, but any greater water pressure is no disadvantage. The

glass Gauge K, on the side of the water feeder, indicates the exact height of the water in the boiler, and gives notice if from any cause the supply fails.

The Tube D is a Hydrostatic Column connected with the bottom of the boiler, being in effect a part of the boiler itself, and is *always open to the external air*. It bears the same relation to the boiler that the tea-kettle spout does to the tea-kettle, and renders it equally as safe from explosion or collapse.

Before steam is generated, the water in the tube and boiler is on a level; but when the fire is kindled and more steam is generated than is required to fill the steam chamber and the Radiators that are open to receive it, a pressure is created upon the surface of the water in the boiler, and this counterbalancing column rises. When the steam accumulates to the pressure of one pound to the square inch, the column will stand twenty-six inches above the level of the water in the boiler, according to a well known law of nature. This simple process is employed to regulate the draft to the fire as well as the accumulation and pressure of steam.

To this column are attached three bowls—E, F, G,—with elastic heads connected with levers, as seen in the engraving. Into the first, E, the water rises at a given pressure (say one pound,) and closes the draft to the fire by the ash-pit and draft door M. This exclusion of air, with the Radiators in operation at the same time, will prevent the increase of the pressure. But should the Radiators not be open to use the steam, or the draft door be accidentally held open, the column of water will continue to rise, until at the pressure of one and a half pounds it flows into the second bowl, F, and lifts the lever attached to the feed door, L, which opens and causes the draft to pass over the fire instead of underneath and through it. This reversal of the draft has the effect to deaden the fire at once and stop the generation of steam. A slight additional pressure forces the water of the column into the third bowl, G, and lifts the lever attached to the escape valve, H, which allows all excess of steam above that pressure to pass freely off through the waste pipe, I. *Any further accumulation of steam and increase of pressure is utterly impossible.*

The glass tube, J, represented in the cut, is not a necessary part of the apparatus, and may be dispensed with; but it is connected to show the variation in the pressure of the steam, making a perfectly accurate steam gauge, sensitive to the slightest variations in pressure. The draw-off valve, N, is used when the boiler is to be emptied of water and sediment.

THE PIPES,

C C, are Wrought Iron Steam Pipes for conducting the steam from the boiler to the Radiators. They are generally concealed within the walls or beneath the floors, and are placed on an incline, so that all water resulting from the condensation of steam in the Radiators may run back to the boiler, to be again generated into steam. By this arrangement of returning the water warm to the boiler, a saving of fuel is effected, all danger of freezing obviated, and but a very small daily addition of water is required to keep up the supply.

THE PERFECT SELF-REGULATING OR AUTOMATIG CHARACTER

Of this apparatus can be seen from the foregoing description. The fire being kindled and a supply of coal put on, no further attention is necessary. Steam will in a few moments enter all the open Radiators, and instantly impart its heat to the space exposed to its influence. The fire will then burn, and the coal be consumed *only in proportion to the heat required*; for as the amount of heat obtained from the Radiator depends upon the *condensation* of steam therein—as explained in another place—and as the condensation depends entirely upon the temperature of the atmosphere in which they are placed, *the atmosphere is itself the agent to open and close the draft of the fire.*

Thus when the atmosphere is at a close temperature and the apartment cold, the condensation in the Radiator is rapid, a great amount of heat is thrown out, the steam used fast, the pressure taken from the boiler, the draft door opened, as before explained, and the consumption of fuel increased. But as the temperature of the atmosphere is raised and the space grows warm, the condensation of steam in the Radiator diminishes, less heat is thrown off, less steam used, the pressure increased, the regulating column raised, the draft closed, and the fire deadened to the requirements of the steam; or if the steam be shut off from any one Radiator, *just in that proportion will the draft be closed and the consumption of fuel decreased.* It is evident that this important economy of fuel can only be obtained in this form of apparatus, as the closing of a register to exclude the heat from a room does not in the least deaden the fire or decrease the consumption of fuel.

THE SAFETY FROM FIRE

Gained by the use of this apparatus, is of itself worth more than its whole cost. A single glance at the boiler and the fire will convince any one of its perfect safety. The fire is on all sides enclosed with a fourteen inch partition, made up of the water sheet, two inches, the flue, four inches, and the brick work, eight inches. The only external openings to the fire are through the feed spout and ash door, both of which are of iron built into the masonry, and with a pitch inclining inward, preventing the coals from falling outward.

The pipes which convey the steam from the boiler are also perfectly safe. As the pressure of the steam can never exceed two pounds, it follows that the temperature of the steam in the pipes can never at any point exceed 218° , or only 6° more than the temperature of boiling water. This renders them perfectly safe, and they may remain in contact with wood for any length of time without the possibility of danger. This is true, however, of pipes which convey steam generated under a Low Pressure only, and it is the accidents arising from the use of High Pressure Steam which have given rise to any question on this point.

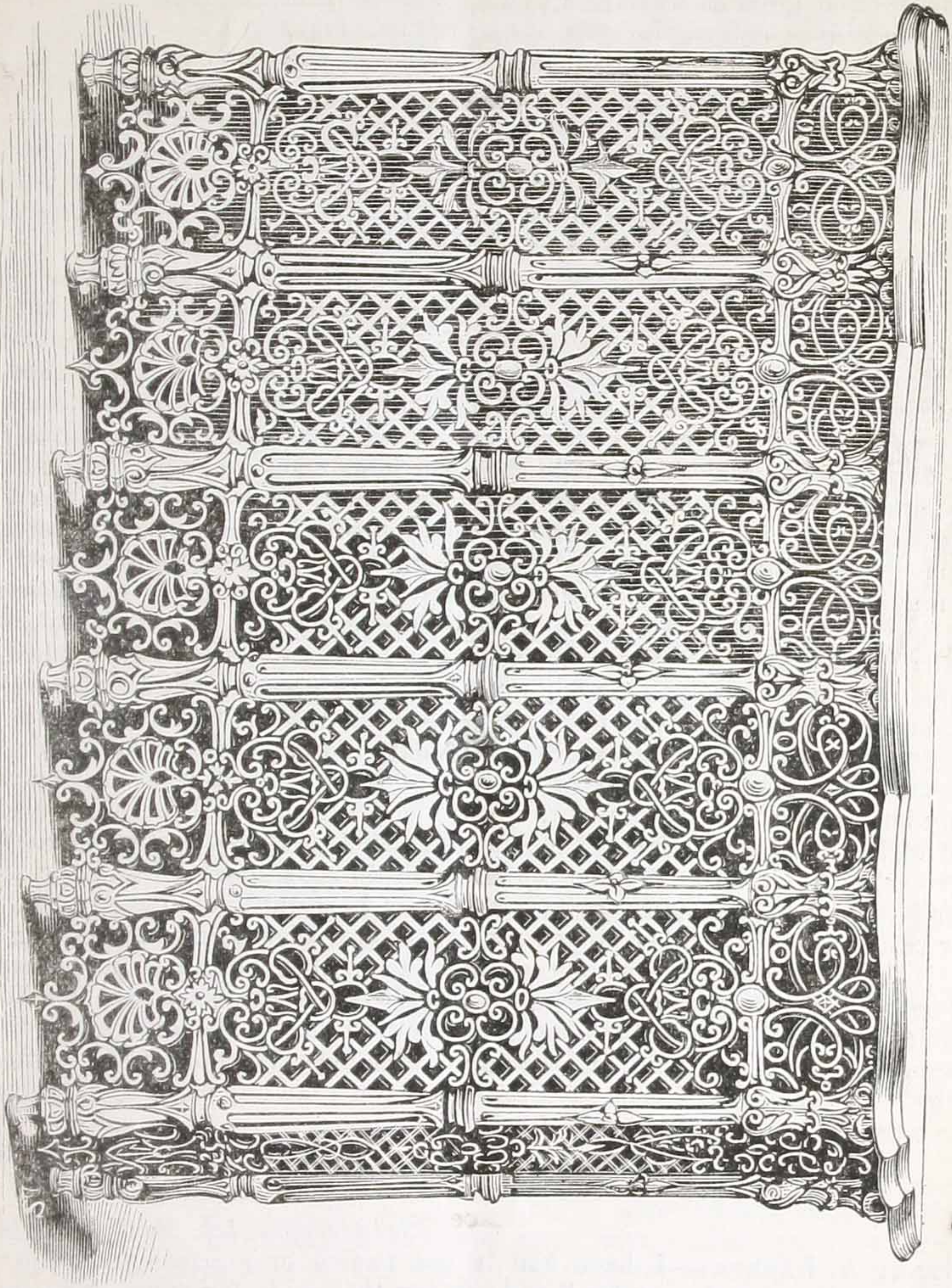
THE DURABILITY

Of the apparatus, and the small cost of repairs, is now settled by the experience of its users far more satisfactorily than it could be by any theory. The fifteen years in which it has been used answer all questions and all objections on this point. The boiler will last, with proper care, as long as any boiler that can be made. The Radiators and steam pipes might seem liable to rapid oxidization, but such is not the fact. The outsides are protected by paint. All experience proves that steam pipes do not rust internally, and the Radiators which have been cut open after twelve to fifteen years use, show the iron as bright and clear as when first made.

It must be borne in mind that when first filled with steam, the atmosphere which produces the oxidization is driven out; and when not in use they are perfectly dry, and by closing the valves may be kept air-tight.

The repairs necessary are very trifling. The flues must be yearly cleaned as in any other heater. But there are no new brick to be put in, and no fire pots to replace those cracked by excessive heat, as with the furnace, so that in course of years the additional first cost may often be saved on the repairs.

After an experience of fifteen years in constructing Low Pressure Steam Heating Apparatus, we may be pardoned for saying, that we believe nothing ever made for a heating apparatus has given such universal satisfaction; and with a constantly increasing business, and a corresponding increase of facilities for doing business, we intend that in the future the present reputation of our work shall be fully sustained.



Straight-Front Screen for Halls, Drawing Rooms, &c.

TESTIMONIALS.

From HON. JOHN WOOD, Conshohocken, Pa.

Conshohocken, April 22, 1872.

H. A. BARBER.

Dear Sir:—I have had one of the "New Haven Low-pressure Steam Heating Apparatus" in my dwelling-house for the last seventeen years, being the first one put in in Pennsylvania. It has given me perfect satisfaction. The radiators still being as good as when first put in. There is no difficulty in keeping all parts of the house comfortable, even when the thermometer is below zero (out-doors), if the radiators are properly distributed and sufficient boiler room is given to supply them. It can be managed by an ordinary servant, and is so arranged that it entirely does away with any possible danger, as far as I have seen after using it seventeen years. It is, in my opinion, the only perfect plan of heating a house that I have yet seen. It is economical and always reliable, will use less coal for the amount of heat given than any other plan, as they are self-operating, and cannot waste fuel. I can cheerfully recommend it as the very best heater that I know of.

Germantown, 4th Month 30, 1872.

FRIEND BARBER:—In answer to thy inquiry in regard to the "New Haven Steam Heating Apparatus," put into my dwelling in the fall of the year 1859, must say that it has been perfectly satisfactory in every respect. My dwelling is built upon an elevated ground, and exposed on every side, and contains ten large rooms, besides halls and stairways, and yet in the severest weather every part is comfortable, with a summer-like temperature, about seventy degrees. In quality the heat is superior, in my judgment, to that produced by any other apparatus, whether hot-air or steam. And in quantity it has always been abundantly adequate to our needs. The management of thy heater is easily understood, and it requires but little attention during the twenty-four hours; and, after thirteen years use, its durability has been fully tested, as no part as yet has given way. The quality of the air heated by thy Apparatus meets a want long felt for persons with weak or diseased lungs, and, in fact, brings at command the pleasant warmth of June to the invalid without the discomfort of travelling to it. In point of economy, after the first cost, it is decidedly the cheapest heater as regards repairs or fuel, as from its automatic arrangement it can only burn as the heat is required. And one reason for this is why a smaller amount of heat will heat a greater amount of space is that by heating the coldest air in the room, as it is near the floor, it has only to heat the air of a temperature of forty or fifty degrees, while those taking the air from out-doors have to heat air at or near zero. And in another point it all excels any other warm-air heating apparatus: it brings no dust into the house. We find no dust settling upon the furniture, and some of the constantly used carpets need no shaking for two years. We also never think during the day of shutting the doors leading to the different rooms, the heat being uniform throughout, and we hardly ever have colds and are ever free from headache. In conclusion I must say that it is better than any other apparatus which aims to combine heating and ventilation by one apparatus.

Respectfully,

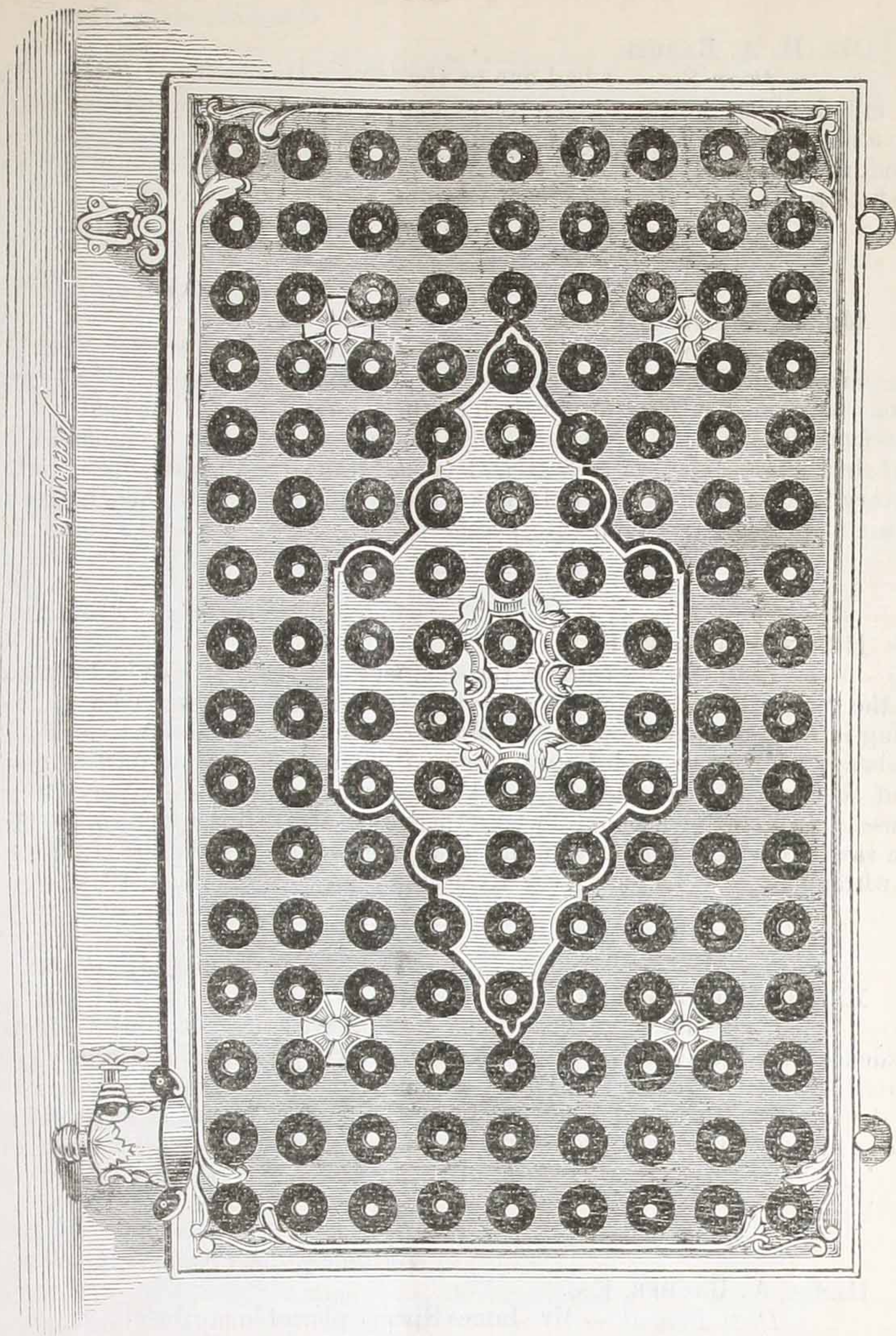
CHARLES NOBLE, M. D.

Philadelphia, 5th Month 2, 1872.

HENRY A. BARBER:—I have had in use twelve or fourteen years the "New Haven Steam Heating Apparatus," and can say that it is far superior to any kind of heating at the present time. It has given me the most complete satisfaction and is so simple that an ordinary person can attend it. I cheerfully recommend it to all who desire a durable and safe Heating Apparatus, as it gives a pure, mild heat, and in every particular as regards saving of coal (having used about $1\frac{1}{2}$ tons per month), and in regard to labor, cleanliness, etc., it is certainly unsurpassed.

N. SCHOLFIELD.

RADIATOR.



From CHARLES S. STINSON, Norristown, Pa.

Norristown, May 1, 1872.

MR. HENRY A. BARBER:—I have had your Steam Heating Apparatus in my house for the last three winters, and it gives me pleasure to say that it has proved a success in every particular. I would not be without it for double its cost. You can refer any one to me that you may desire to see the Apparatus.

Norristown, May 5, 1872.

Dear Sir:—I have had in use for several years the "New Haven Steam Heating Apparatus," and consider it far superior to any arrangement I have ever used for heating purposes, dispensing a most agreeable and genial heat.

W. T. KOPLIN.

Conshohocken, April 26, 1872.

MR. H. A. BARBER.

Dear Sir:—I had one of the "New Haven Patent Steam Heaters" put in my dwelling house sixteen years ago. It has given perfect satisfaction, and I have no hesitation in saying it is superior to any other heater yet known, either for comfort, cleanliness, health or economy of fuel, and I can assure any persons who wish to try it that they will not be disappointed.

J. K. REID, M. D.

Norristown, April 29, 1872.

MR. HENRY A. BARBER.

Dear Sir:—I had put into my house and offices a "New Haven Low-pressure Steam Heating Apparatus" about fifteen years ago. My experience with it has been most satisfactory in both quality and quantity of the heat. It is perfectly free from dust, gas or burned air, and concurs in all that is claimed for it. I will add that it is decidedly the best and cheapest heating arrangement out. So satisfactory is it to me that I would not exchange it for any of the many other heaters in use at present.

Yours Respectfully,

JAMES BOYD.

Norristown, April 29, 1872.

HENRY A. BARBER, ESQ.

Dear Sir:—During the last sixteen years I have had my house heated by the "New Haven Patent Steam Heater." It has never given us any trouble, being in as good condition as the first year of its introduction. Self-regulating, it is always safe, requiring little attention; it is also free from dust or gas; the heat is of the most healthy and pleasant kind, a summer apparently pervading the whole house. In point of economy, where there is considerable space to be heated, there is a saving of fuel. In fact it has always given such satisfaction that I would not be without it.

Yours Very Respectfully,

ABRAHAM R. COX.

Norristown, April 29th, 1872.

MR. H. A. BARBER.

Sir:—Having used the "New Haven Patent Steam Heater" in my residence over fourteen years, it affords me much pleasure to inform you that it has proved satisfactory in all respects. If the Apparatus be properly constructed and all the joints well made, I believe it to be the most economical, healthful and cleanly heater in use. The heat produced is mild and pleasant like the warmth of summer.

Yours respectfully,

F. B. POLEY, M. D.

Philadelphia, Pa, 5th Month 7, 1872.

HENRY A. BARBER, ESQ.

Dear Friend:—Mr. James Spence placed in my dwelling-house the "New Haven Steam Heater," and we have had it in use during all of last winter. I can recommend it for economy and cleanliness. My family are delighted with it and consider it indispensable. The whole house is heated without the annoyance of dust or ashes. The heat is moist and pleasant.

Yours, &c.,

ELIJAH THOMAS.

Conshohocken, April 30, 1872.

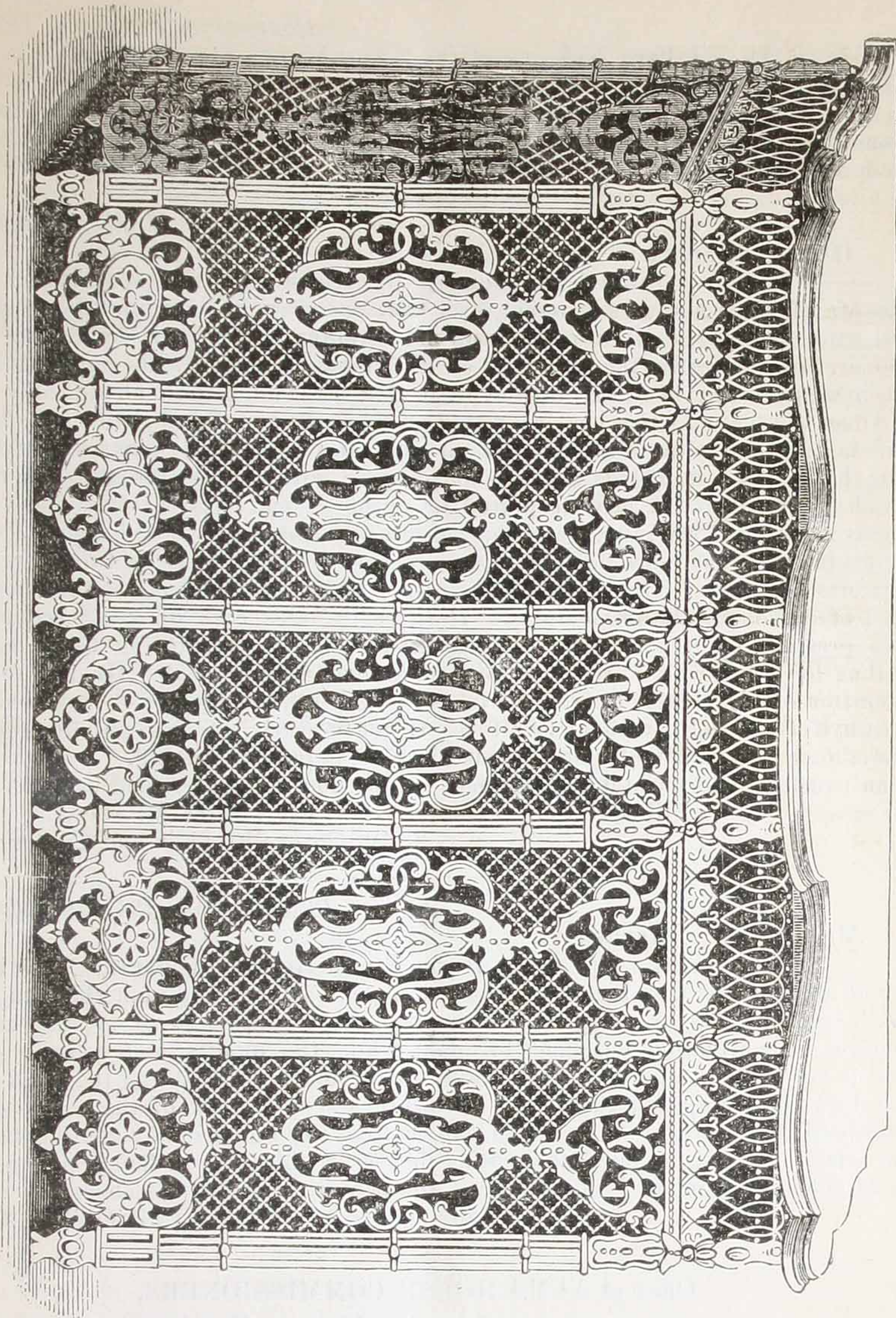
MR. HENRY A. BARBER.

Dear Sir:—You ask how I like "Gould's Patent Steam Heater." My answer is, after having it in use ten years, that it has been entirely satisfactory, has not cost anything for repairs, and I think it preferable to any other plan for heating houses.

Respectfully Yours,

LEWIS A. LUKENS.

Straight Front Screen, for Parlors, Drawing-Rooms, &c.



Norristown, May 6, 1872.

MR. HENRY A. BARBER.

Dear Sir:—It gives me pleasure to bear testimony in favor of your Heating Apparatus. Having been among the first to introduce it. And though great improvements have been made in Radiators, in regard to style and finish, yet mine has given us a heat most agreeable, and with a consumption of fuel that is small indeed for the amount of space heated, as my house is large and exposed. We would not do without it. Respectfully,

P. GILINGER.

Conshohocken, May 6, 1872

Dear Sir:—I have had one of the "New Haven Steam Heaters" in use for the last three years, and have no hesitation in recommending it to parties desiring to heat their dwellings perfectly and economically. There is no dust thrown off from it into the room and the heat is decidedly more pleasant and healthy than that from a hot-air furnace.

Yours Respectfully,

JONT. R. JONES.

Philadelphia, May 8, 1872

HENRY A. BARBER.

Dear Sir:—I can unqualifiedly recommend the Automatic Steam Heater, of which you are the agent, as I fully tested its heating qualities during the last winter, having built a new store and dwelling *at a corner*, containing twelve rooms; consequently the interior of the building was much exposed by the mechanics working in it, yet at the same time my family were comfortably warm. If I had not had an extra heat we would no doubt have suffered with the cold; my wife is delighted with it as there is no dust and is as easily managed as the gas. The heat which it affords is mild and pleasant, without the uncomfortable dryness which accompanies the heat generated by furnaces and stoves. The doors of our rooms are usually wide open, and the warmth penetrates the whole house. Even the rooms in which there are no radiators are (except in extremely cold days) rendered comfortably warm. The automatic principle of the Apparatus is by no means the least of its commendatory features. *It literally takes care of itself*, regulates its own pressure of steam during the day and night, only requiring to be fed with coal at long intervals. My youngest child can attend to it. Having seen the operation of the Heater for several years back, I fully determined to have one when I built if I had to do without furniture. I am perfectly satisfied with its economic use of fuel, although I at first regarded it as an expensive buying. I now consider it an excellent and profitable investment for the pocket, comfort and health.

Respectfully Yours,

FRANCIS M. WOOD,

S. W. Corner Franklin and Coates Street.

Philadelphia, May 8th, 1872.

MR. HENRY A. BARBER.

Dear Sir:—The "New Haven Steam Heating Apparatus" has been in use at my house at Conshohocken since the year 1857, and do not think too much can be said in its favor. My experience is most favorable in every respect, as it requires little attention, consumes less fuel, while the quality and quantity of the heat is not to be compared. It is wholly free from smoke, dust and the smell of gas, and does not dry up and shrink the furniture and woodwork of the house, and am convinced that there is no possible danger from the boiler in any contingency that can arise. In fact, on building another house in this place I had it put in, as we could not do without it. You can send any person to me for reference.

Respectfully Yours,

DAVID L. WOOD.

Office of ALMS HOUSE COMMISSIONERS,

Poughkeepsie, New York, August 8th, 1873.

HENRY A. BARBER,

Yours of August 5th is at hand, asking information about the Warner Furnace, &c., in reply would say that I have been appointed superintendent this May, I have seen but little of the working of the Furnace, but the former superintendent says that it is all that could be desired, a great saver of coal, &c., our building is 160 feet long by 55 wide, we have 42 rooms that are heated by it, and in the coldest weather is comfortable, and the Heater has been in use five years.

Respectfully Yours,

LAWRENCE W. DUTCHER, Superintendent.

Mexico, August 9th, 1873.

MR. H. A. BARBER,

Dear Sir:—Yours of 5th at hand, in reply to your inquiry, would say,
1st, as to size of building 300 feet around outside and contains two stories and basement.

2d. Has been used two and a half years.

3d. The difference in consumption of fuel between steam and hot air, we think to be but little, for the same amount of room.

4th. The number of rooms and halls warmed by steam is 41.

5th. It gives good satisfaction, we do not wish to exchange it for any apparatus with which we are acquainted, we, also use steam from the same Boiler for cooking, washing clothes, &c. Our apparatus is called the Low Pressure Steam Heating Apparatus, manufactured by Wyllis H. Warner, 113 Leonard Street, New York.

Yours, &c.,

GALLET TULLAR,

Keeper of Oswego Co., Poorhouse.

Office of THE BOARD OF EDUCATION,

S. M. Rust, Pres't.

Edward Smith, Sup't.

Syracuse, New York, August 11th, 1873.

MR. H. A. BARBER,

Dear Sir:—Yours of the 9th inst. inquiring for particulars of our Heating Apparatus, in the Syracuse High School is before me, and I will give as well as possible the information sought.

1st. Our building is 196 feet by 124 feet, three stories beside basement, and is divided into 20 rooms.

2d. About 120 tons of coal is needed for a year, which is about 1-5 less than we use proportionally in building, heated by hot air furnaces, besides affording a much better and more healthful atmosphere.

3d. We have no difficulty in heating all parts of the building, except in very sudden changes, against which a janitor cannot guard when a little time is needed to secure proper heat.

Hoping this will give what you desire.

I remain very truly yours, &c.,

EDWARD SMITH, Sup't School.

New York, August 11th, 1873.

MR. H. A. BARBER, ESQ.

Dear Sir:—At the request of Mr. Wright, Chairman of the Board of Trustees of 9th Ward Schools, I answer your letter of the 8th inst. asking about our Heating Apparatus, I would say we have 22 rooms, the smallest is 25 by 20, to heat. We have two of Warner's large size Boilers connected with forty-six radiators. We burn about 70 tons of coal during the winter, which gives all the heat required. As regards consumption of coal, between hot air and steam I should say that there is about 25 per cent. in favor of Steam, as used in our Boilers. I should be pleased to show you the working of the Apparatus if you will call on me, any time you may be in the city, and hoping that I have answered to your satisfaction,

I remain Respectfully Yours,

J. K. EDGERLEY, Janitor, Grammer School No. 16, 210 W. 13th St., N.-Y.

MR. HENRY A. BARBER,

New York, August 15th, 1873.

*Dear Sir:—*Yours of the 9th received.

Grammar School 34, is 106 feet front, 88 feet deep, 4 stories high, contains 28,000 square feet, has 3 main rooms, 30 class rooms, play ground and cellar all heated by Warner's 4 Apparatuses to our entire satisfaction and a great saving of fuel. We have used hot air, but for 12 years these heaters have been in use in this building with less expense than any other heating apparatus in this Ward.

Respectfully Yours,

FREDERICK HOLSTEN, School Trustee, 13th Ward,
No. 148 Delaney Street

TREMONT HOUSE, NEW HAVEN.

February 11th, 1874.

HENRY A. BARBER,

*Dear Sir:—*My house is three stories high, 47 feet by 92, and heated throughout except the upper story. I only know the quantity of coal consumed in the house for all purposes, cooking, heating, &c., which is about 120 tons per year. I do think this Apparatus the *best* of any, (every thing considered) for a house similar to mine or larger.

Yours, &c.,

ENOS FOOT.

NEW HAVEN HOSPITAL,

New Haven, Conn, February 11th, 1874.

HENRY A. BARBER, ESQ.

*Dear Sir:—*Yours of the 10th is received. In reply will say, that we have two boilers and 27 radiators. I do not know the size of the boilers, they consume about 60 tons of coal a year, we like them very much, you can get all of the particulars by addressing, Blakeman & Latham, New Haven, Conn.

Very Truly Yours,

DOUGLAS FAIRCHILD.

New Haven, February 12th, 1874.

HENRY A. BARBER,

*Dear Sir:—*The Steam Heating Apparatus in the Theological Department Building here, has given entire satisfaction. The Building is four stories high, and at the two ends five stories, the number of rooms for students is fifty-four, say 10 to 12 by 16 feet, with four large lecture rooms, &c., a janitor's department and a chapel some 50 by 38 feet. It is my impression that the apparatus is the best on the college grounds, but I have known more about this than of the others. I think in durability it will equal any other heater.

Yours very truly,

T. DWIGHT.

NATIONAL PARK BANK.

New York, February 12th, 1874.

HENRY A. BARBER, ESQ.

*Dear Sir:—*Yours 11th received. Our Banking Room measures 56 by 80 feet with 45 feet roof. Takes about $\frac{1}{2}$ ton of coal per day to heat it, and gives us entire satisfaction with our Heating Apparatus.

Yours Truly,

J. L. WORTH,

Per D. Baum.

GERMANIA FIRE INSURANCE COMPANY,

New York, February 16th, 1874.

HENRY A. BARBER, ESQ., 524 N. 8th Street, Philad'a.

Dear Sir:—In reply to yours of 14th, would say that our Radiating Steam Heater works well and economically.

Respectfully,

RUDOLPH GARRIGUE, President.

BROOKLYN FIRE INSURANCE COMPANY.

New York, February 16th, 1874.

Dear Sir:—The Heating Apparatus in our basement is built entirely of brick and iron, it feeds itself with water and regulates itself, and heats our part of the building, (which is the 1st floor) satisfactorily, also, the upper part of the building. It is so arranged that we hardly think a fire could originate from it.

Very Respectfully Yours,

A. W. SELLECK, for Company.

HENRY A. BARBER, ESQ.

Academy Mt. St. Vincent.

Dear Sir:—Our building is 530 feet long, 60 feet deep alway through, with one projection of 155 feet by 60 feet. Four stories of the principal building are heated by steam, or, five of an addition 100 by 60. The heat is uniform, healthy and most agreeable. We are very partial to the Low Pressure method of heating. Our Furnaces consume about 250 tons of coal yearly,

With kind regards, I am, Yours, &c.,

MOTHER W. REGINA.

Norristown, February 16th, 1874.

HENRY A. BARBER, ESQ.

Dear Sir:—It affords me great pleasure to inform you, that the Steam Heater you put into my house last year gives *entire satisfaction*, and having been *humbugged* with another *Steam and Hot Air Heater*, I don't hesitate to say that I would not permit another such one as I had to be put into my house free of charge. I am *perfectly delighted with your Heater*, and take great pleasure in recommending it to the *public* as the most *durable and saving in fuel* of any heater I have ever seen.

Yours Respectfully,

J. R. HUNSICKER.

Philadelphia, February 23d, 1874.

MR. HENRY A. BARBER,

Dear Sir:—I purchased the property No. 1904 Green Street, in 1871, which was heated by one of your Low Pressure Steam Heating Apparatuses and believe it was put up in 1859, and has been in constant use since that time.

After two years use I have no hesitation in saying, not only that I am fully satisfied with the same, but that the convenience, safety and automatic working is better than I anticipated. The heat is most agreeable and free from gas, dust and smoke; heating all parts of the house on an equal temperature, and of a quality, far superior to Hot Air Furnaces.

I most cheerfully recommend your Apparatus to those desiring a safe, pleasant and economical mode of warming their dwellings,

Respectfully Yours

H. E. FULLER.

CORNER WALNUT LANE AND MORTON STREET,

Germantown, February 18th, 1874.

H. A. BARBER, ESQ.

Dear Sir:—It gives me pleasure to state that the Steam Heating Apparatus, put up by you in my house in the fall of 1872, works to my entire satisfaction. It gives abundance of heat at the same time to the farthest as to the nearest part of the house, without dust or coal gas. The room doors in the coldest weather are constantly open, the temperature uniform, and the air mild as summer's air, without unpleasant currents.

The Furnace requires no more than ordinary attention, the automatic working of the draft enabling it to almost take care of itself. It seems entirely safe from fire and explosion.

The Radiators, Screens and Marble Mantles are ornamental and not in the way. I burn a ton of coal on an average in two weeks, the size of house is about 30 by 50, 3 stories high. I am confident I could not heat it, as I now heat it, with less than two ordinary furnaces, and consuming more coal than I now do. You are at liberty to refer to me.

Yours Very Respectfully,

ELLWOOD BONSALE.

Philadelphia, Feb. 19, 1874.

Mr. HENRY A. BARBER,

Dear Sir—After two years' use of your Steam Heating Apparatus, I cheerfully add my testimony in favor of your mode of heating. Indeed I cannot say too much for it. As you know, I tried to heat my house (eight rooms) with another steam apparatus, but failed as to quantity and quality of heat.

You will remember, I gave a full investigation to other modes before deciding to change for your apparatus. It is easily managed, and the quality and healthfulness of the heat produced cannot be surpassed.

I feel more compelled to speak of your apparatus as strongly as I do from the fact, that during the last winter all my children (three) had the scarlet fever, and being advised by our family physician to keep the house at an even temperature, (60 degrees) did so for two months, and from this cause not one of them, on recovering from the attack, were left with any disagreeable complaints generally following this disease.

For economy, simplicity, and summer-like heat, it is the best, and I would not take any money for it.

M. B. ALLEBUCH, 126 North Second Street.

Philadelphia, Feb. 26, 1874.

Mr. BARBER,

Dear Sir—I have had two winter's experience of your Steam Heater, and can recommend it highly.

Yours respectfully,

CRAW. C. COATES, 4302 Spruce St.

Philadelphia, 3rd mo. 3, 1847.

Having seen several dwellings heated by the New Haven Steam Apparatus, and from the strong recommendations of judicious friends who had thy heater in use from twelve to fifteen years, I felt convinced that it was the best mode of heating either large or small dwellings; and having leased the dwelling No. 1607 Chestnut Street, for a Boarding House—containing 37 rooms—of these, 22 rooms are heated by thy apparatus, and I can truly say that I am delighted with the heat produced; no smoke, gas or dust, and the heat of one room is entirely independent of the other. I feel assured, that for

quantity or quality of heat, its apparent durability, economy in consumption of fuel,—(being self-regulating)—it cannot be surpassed.

With a little care, a genial equable temperature is maintained in every room, day and night. In fact, there is no heating apparatus so adapted to variations of outside temperature, or more admirably fitted to minister to the convenience and comfort of a household—as nothing is taken from or added to the atmosphere it warms.

I most cheerfully add my testimony to the merits and advantages of thy Heating Apparatus, and can recommend it to all.

ANNA P. COOK.

Names of persons having the "New Haven Steam Apparatus" in use.

A. J. Anderson, Esq , Norristown, Pa.	M. K. Preston, M. D., Norristown, Pa.
M. C. Boyer, " "	H. Quillman, " "
Jas. B. Patterson, " "	Chas. Christman, " "
George Steinmetz, " "	P. E. Coleman, " "
William Stahler, " "	Jacob Quilman, " "
Selden May, " "	Jas. Moir, Conshohocken, " "
John Jones, " "	Stanly Lees, " "
C. Blonnts, " "	Mrs. John Whitton, " "
Jas. Schrack, " "	Alan Wood, " "
George Wright, " "	Jas. Wood, " "
Mahlon Ambler, " "	H. E. Rutter, Germantown, " "
Dr. F. A. Ramsay, " "	Jonatham Gillam, Attleboro' " "
A. K. Weand, Esq. " "	Furman L. Mulford, Millville, N. J.
A. F. Porter, " "	H. A. Barber, 856 North 8th St.
Directors Public Schools, " "	Peter Raeb, cor. 7th & Parrish Sts.
Benjamin Harry, Conshohocken, " "	W.F. Potts & Co., 1225 Market St.
Directors Public Schools, " "	E. P. Moore & Co., 1147 Beach St.
F. Backus, Germantown, " "	B. Barber, 1741 Fairmount Ave.
E. N. Wright, " "	Pennsylvania Hall, cor. 8th & Depot.

We also append a few of the Public Buildings heated by our Apparatus

Yale National Bank, New Haven, Conn.	Manhattan Gas Light Co., 4 Irving Place, N. Y.
Townsend Saving Bank, " "	Nat. Academy of Design, 53 E. 23d St., " "
N. Haven National " " "	Central Park Museum, Central Park, " "
Connecticut Savings " " "	Union League Club, Madison Ave. & 26th St, " "
Tontine Hotel, " "	St. Vincent Hospital, 195 West 11th St. " "
Orphan Asylum, " "	Yonkers & N.Y. Fire Ins. Co., 176 Broadway, " "
Old Ladies' Home, " "	Globe Fire Ins. Co , 176 Broadway, " "
Eagle Hotel, " "	Adriatic " " 187 " "
Congregational Church, E. Haven, " "	Atlantic " " 178 " "
Birmingham High School, Birming'm, Ct.	Columbia " " 161 " "
Fourth National Bank, 16 Nassau St., N.Y.	Lenox " " 158 " "
Shoe and Leather " 271 Broadway, " "	Dutchess County Jail, Poughkeepsie, " "
Imp's & Traders " 247 " "	Onondago Co. Penitentiary, Syracuse, " "
Mercantile " 191 " "	Geneva Classical School, Geneva, " "
Eighth National " 650 " "	Central Presbyt'n Church, Rochester, " "
Phoenix " " 45 Wall St., " "	Drew Theological Seminary, Madison, N.J.
Marine " " 78 " "	Ft. Wayne & Chicago R. R. Office, Pittsburg, Pa.
Union " " 34 " "	County Court House, Cleveland, Ohio.
Nat. Bk of the Republic, 90 Broadway, " "	City Police Court House, " "
Union Pacific R.R. Co., 20 Nassau St, " "	Lake Shore R. R. Offices, " "
U. S. Express Co., 82 Broadway, " "	War Department, Washington, D. C.
N. Y. Gas Light Co., 159 Hestor St., " "	Georgia Home Ins Co., Columbus, Ga.

